Book of the month

The 21st Century Brain

Steven Rose, a neuroscientist specializing in memory and developmental biology, has a gift for explaining his subject in clear prose. After forty-five years in the field and nearing retirement, he sums up in *The 21st Century Brain*[1] his views on where neuroscience has got to already and where he fears it may go in the future. The book thus falls into two parts.

The account of the brain today rehearses material already familiar from a multitude of books published over recent years. The most useful information, I thought, was on memory—a subject that ought to be central in any picture of mind or brain but which often gets treated almost as an optional add-on. What's more original than the factual content is the spin that Rose puts on the material. He's very against the dichotomies (nature/nurture, etc.) that pervade so much of the thinking. As for evolutionary psychology or behavioural genetics, those currently 'in' subjects, well . . . evolutionary psychology, he says, often amounts to nothing more than a collection of Just So stories, while behavioural genetics commits a category error whenever, as commonly occurs, it treats the genetics alone as having primacy over complex genetic/behavioural/environmental/cultural interactions. Another Steven (i.e. Steven Pinker, author of *How The Mind Works*) is his particular *bête noire* here.

The arguments are cogent, and I was pleased to find Rose sharing my amazement that evolutionary psychology is ever regarded as more than an amusing parlour game. Though it is almost entirely an armchair exercise, strong conclusions about our supposed 'human nature' have been drawn from it. But Rose does rather overdo his case against behavioural genetics. Early in the book, for instance, he can be read as saying that any attribution of modularity to mind is mistaken; but later, he happily recounts evidence showing that mind must be modular in some respects. The messages that he probably wanted to convey earlier were that modularity does not arise solely from genetically determined hard-wiring but through interaction of wiring rules with physical and social environments. Also, modularity is not the *whole* story about mind. One can only agree with him on both these points. So far so good. What about his views on the future, though?

He is less concerned about where neuroscience will go than about the uses that may be made of it. He says that neuroscience 'segues into neurotechnology'. The scene is set through description of the half-baked or plain wrong suppositions that underpin much past and current psychiatric treatment. His examples include the notions that depression is a serotonin deficiency disease treatable with Prozac, that schizophrenia is a dopamine excess disease needing dopamine blockade, and that 10% of American children have dopamine deficiency requiring Ritalin. In reality the supposed 'diseases' are ill-defined and arise from complex causes, most of which are social (at least in the case of attention-deficit hyperactivity disorder). Simplistic treatments are generally far from curative and have unpredictable effects on complex neural systems, often manifest in nasty consequences.

Going further back, he touches on the medical fashion for severing people's frontal lobes from the rest of their brains (lobotomy). An even better example, which Rose does not mention, has to do with the pre-World War II concept that chronic mental illness might be due to 'focal sepsis'. As a consequence many asylum inmates were quickly relieved of their teeth, tonsils, adenoids and even their appendices too. Some American surgeons threw in the whole colon for good measure, but doing this resulted in such horrific post-operative morbidity and mortality that few followed their lead. Will the future be like the past, is Rose's implicit question, the answer being 'yes'. What then can we look forward to?

One interesting point is that the rush to unwise treatment is driven not only by the commercial pressures and medical imperialism that he describes but also by the more pardonable urge to do *something* for the appalling weight of suffering that exists out there. New treatments often do seem beneficial in some patients irrespective of *what* is done. Double-blind trials should in theory obviate this difficulty, but in practice they prove temperamental or unreliable guides. Hence, fashionable new treatments quickly become established before their downsides have become manifest. Beneficence detached from sound knowledge of the brain, Rose might have said, can be just as harmful as the activities of those popular scapegoats the marketing departments of drug companies. Indeed the two often work in concert to produce absurdities.

So we can expect more of the same. People will fasten prematurely on new techniques or theories to promote treatments that will turn out to be mixed blessings at best. Moreover, the military and the police will continue to research means of disabling people, controlling their thoughts or detecting their lies. Much of this is pie in the sky, Rose points out. A good example cropped up as I was writing this review. News came that one of Sony's divisions has applied for a patent on a technique to create virtual-reality experiences by beaming ultrasound into people's brains. But even assuming the company did not fry or scramble their customers' brains in the process, or convert their glia into gliomas, how could they ever achieve the necessary precision? Pictures of brain scans in books look very nice, but they are usually averaged pictures. In the real

world every brain differs from every other in anatomy and in the way function is distributed across the anatomy.

Rose is pessimistic about the uses that may be made of future neuroscience. I am less pessimistic. He and I are in agreement that no purely neural 'mind control' technique is likely to come close to the efficiency of methods used by Nazis and Communist parties in the past. Social factors have far more influence than physical ones on what we think and how we behave. However, he puts less weight than I would on the fact that increasing knowledge of the brain and body has on the whole reduced the chances of very nasty treatments coming into vogue. The same applies, to a lesser extent, to means of control. To put it crudely, if one is going to take a useless treatment, better diazepam than the older phenobarbitone; if one is going to be shot, better with a taser than with a Colt 45. And ameliorations such as these depend on progress in the underlying science and technology. He is not even particularly optimistic for the prospects of what is often considered one of the most promising future techniques—the use of (neuro)genetics to predict which treatment is going to benefit a patient and do no harm. His reasons for gloom are, first, that the more targeted a treatment, the smaller the number to whom it will apply so the less incentive companies will have to develop it; second that, in psychiatry at least, there is scant prospect that precise genetic causes will be identified.

In the final chapter Rose calls for establishment of ethical bodies that will oversee neuroscience, akin to those that concern themselves with genetic engineering. I am not so sure this is a good idea. Interventions of this sort commonly generate confusion, impede progress, or end up having the opposite effect to that intended. As Rose himself points out, governments tend simply to ignore recommendations they don't like. Surely what we need are more people like Rose, not to pontificate over ethics but to tell us what the brain is really like and to let us know when our thinking about it has gone awry. In *The 21st Century Brain* he has made an excellent start.

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REFERENCE

1 Rose S. *The 21st Century Brain: Explaining Mending and Manipulating the Mind*. London: Jonathan Cape, 2005 [344 pp, £20, ISBN 0-224-06245-9 (h/b)]

The Lobotomist

Jack El-Hai
368 pp Price £19.99 ISBN 0-471-23292-0
London: John Wiley

Among surgical operations, only castration can compete with lobotomy for emotive impact. No procedure is as notorious as the now defunct operation comprising the freehand severing of neural connections between the prefrontal cortex and the rest of the brain.

It was for conceiving the prefrontal lobotomy that the suave Portuguese neurologist Antônio Egas Moniz won a 1949 Nobel Prize. Around that time an American neurologist, Walter Freeman, had just popularized an outpatient version of it using an implement passed through the orbit. His invention of the quick and crude 'ice-pick procedure' led within just two decades to 10 000 lobotomies in Britain and 60 000 in the USA, over 3000 of them by his own hand. It is Freeman who is the subject of Jack El-Hai's biography *The Lobotomist—a Maverick Medical Genius and his Tragic Quest to Rid the World of Mental Illness*.

El-Hai finds Freeman a 'biographer's dream: an engaging writer with a substantial ego' who 'never feared setting down his professional speculations, no matter how outrageous or controversial'. The author uses his rich sources to convey myriad influences upon a complex character. We are taken first to Freeman's illustrious medical ancestry—his grandfather W W Keen pioneered colostomies and did the first brain tumour excision in the USA. After an aloof childhood, average scholastic achievement then colourful beginnings in neurology, Freeman's clinical practice and academic stature become transformed by his expertise in lobotomy. His opportunism and exhibitionism at first gain him admiration among colleagues, then notoriety and rejection, and ambivalent affection from many patients.

The foundations of psychosurgery form a unique and intriguing chapter in medical history involving an alliance of clinical specialists, generalists and scientists, all trying to help a desperate group of patients. The medical climate that led to its application should be considered against the background of social, ethical, and political conditions and controversies that surrounded its practice. Deconstruction of its chief protagonists gives insight into the intellectual status of clinical science and the personal influences on the uptake of medical innovations.

Psychosurgery has been extensively chronicled and most accounts portray it as an exemplar of medical malpractice. Such narratives depict overzealous physicians instigating a catastrophe and are used to underline the importance of effective regulation. A stark picture is painted of evil doctors forcing abhorrent treatments upon hapless victims, *One Flew*

Over the Cuckoo's Nest being but one example. El-Hai admits that he held similar preconceptions before he read Freeman's considerable writings. However, such a perspective lobotomizes psychosurgery's history of its richness. It might be argued that Freeman and his 'lobotomist' colleagues differed from other doctors of the time because science and circumstances uniquely exposed and eclipsed their medical practice. Our understanding of psychiatric disorders, the mechanisms underlying them and our means of assessing them underwent a revolution between lobotomy's beginnings in the 1930s—against a background of ineffective alternatives such as insulin-induced comas and lifelong institutionalization—and the advent of the first effective antipsychotics in the 1950s.

El-Hai's book illustrates the sometimes uneasy relationship, reciprocal legitimation, between science and the clinic. Moreover, it is a lively biography of a much maligned and misunderstood practitioner. Freeman's dogged crusade to engineer the prominent place of lobotomy in the minds of doctors and lay people alike is at times sobering but is fascinating to the end and mercifully devoid of stereotypes and clichés. Of Freeman's own rise and demise, El-Hai declares that he 'deserves, at the very least, the kind of all-inclusive scrutiny he hoped to give to others'. El-Hai suggests that Freeman was 'the most scorned physician of the twentieth century' after the Nazi Josef Mengele. But was he a cowboy or a pioneer? Functional neurosurgery is currently performed for debilitating psychiatric illnesses refractory to other therapies, including obsessive-compulsive disorder and depression. Stereotactically guided lesioning is undertaken at the Massachusetts General Hospital in the USA, and reversible deep brain stimulation with indwelling electrodes is performed in Canada and mainland Europe. Despite the gaps in the underlying theory and the complete dearth of double-blinded randomised controlled clinical trials, it has matured to multi-disciplinary regulation and evaluation. Many of those who perform such operations may, in private, express some admiration for Freeman, but they are pragmatic enough to realize that the stigma of the pariah who once performed 25 lobotomies in a day and occasionally performed bilateral lobotomies simultaneously—operating on one side with his non-dominant hand alone—does them and their patients more harm than good. In public they are rightly keen to distance their own safe and successful treatments from his. Yet, as El-Hai concludes, 'we should not allow Walter Freeman's ghost to flicker unnoticed in the shadows'. With *The Lobotomist* he has performed a spectacular and worthy exorcism.

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Health Care and the Autism Spectrum

Alison Morton-Cooper
128 pp Price £13.95 ISBN 1-85302-963-7 (p/b)
London: Jessica Kingsley

There are now so many books on autism and related disorders that it is hard to know which to purchase and which to leave on the bookshop shelf. Alison Morton-Cooper, however, has identified a real gap in the market. Her book addresses specifically the healthcare of people with autism and is written with hospital doctors, nurses, and other healthcare professionals in mind. Her own background is in nursing, health education and healthcare journalism, and she is also the mother of a son with autism.

Among the important issues dealt with in *Health Care and the Autism Spectrum* are the ways in which the physical environment, whether GP surgery or operating theatre, can be modified for an individual with autism, how he or she can be prepared for hospital admission or an operation, and how to reduce stress so that maximum benefit is gained from the physical healthcare provided. The book offers practical guidelines for nurses, doctors and others on communication with these individuals, with special emphasis on the need for clear concise language. As she points out, the instruction 'Give me your arm' can lead to untold distress. Many of the suggestions for minimizing stress and enhancing cooperation are simple and easy to implement—for example, make appointments at quiet times of day and keep to the times set (extremely important); consider the use of single rooms in hospitals; and ensure that young patients have their special objects close to them when waking up from an anaesthetic. Other issues covered in this brief but important work are consent to treatment, the management of preoperative and postoperative procedures, pain control, medical support for individuals with chronic conditions, and adherence to the rules of hygiene. The author recognizes the difficulty some nurses encounter when dealing with patients with autism, who do not chat or attempt to socialize in the way that 'normal' patients do. A key piece of advice is to listen to *parents* and pay heed to what they say about the individual's particular needs, sensitivities, and likes and dislikes. The more able or older individuals should be given as much information as possible at each stage of the treatment process.

This short easy-to-read book offers solutions that are easily put into practice without excessive input in time. With such strategies, the medical care of individuals with autism spectrum disorders can be made far less traumatic for all concerned—patient, family, and health professionals.

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The Doctor in Literature: Satisfaction or Resentment?

Solomon Posen
304 pp Price £29.95 ISBN 1-85775-609-6 (p/b)
Oxford: Radcliffe Publishing

Now that the humanities are joining the undergraduate medical syllabus, they can surely not be denied to us who struggle with continuing professional development and revalidation: how pleasant a prospect if seaside holiday reading might contribute to our good standing with the General Medical Council. Better still that physicians, a narcissistic group, might be able to earn brownie points by reading about themselves. (So, pack Ian McEwan's dazzling *Saturday* in your hand baggage to bone up on your neurosurgery.)

Dr Posen, an Australian endocrinologist, has compiled his anthology from prose, poetry and plays that portray the doctor–patient relationship. The subtitle promises good and bad, but he has chosen to exemplify fictional interactions 'especially where these are unsatisfactory': would a collection of satisfactory ones be so thin as to be nugatory? He divides medical practice into eleven sections, starting with the doctor's fee and ending with the physician in court. On medicolegal matters he offers a brief dismissal of expert witnesses (noting that these tend to be third-raters at best) before moving on to litigation against doctors. In between come diagnosis, treatment, the bedside manner and the social status of the doctor. Posen draws on literature worldwide, ranging from the 14th to the 21st centuries: as a chauvinistic British reviewer, a child of the 20th century, I looked in vain for Waugh E or Powell A D but there was lots of Maugham and some Burgess, both of whom had a soft spot for the medical profession. In the 1950s the *Doctor in The House* books had, arguably, as great an influence in breaking down barriers between doctors and laity as television programmes such as *Emergency Ward 10* (fictional) or *Your Life in Their Hands* (documentary) but Richard Gordon is not to be found. Perhaps Dr Posen found him too frivolous and positive about our relationships with patients. (Has this been our downfall? UK health policy seems focused on destruction of the personal doctor/patient relationship; would Tolstoy have written with such insight and sensitivity about a multidisciplinary team dealing with Ivan Illych? Does the medical establishment have no flanking move in its field manual—or is it colluding?). Russian, French and North American authors are well represented: the knowledge, skills and attitudes of the physician creations of Chekhov, Flaubert and Heller will satisfy their readers well into the 22nd century. But was it kind to overlook Joyce? Stately Buck Mulligan may have been, but his medical student behaviour did not suggest that relationships with patients would be smooth. Perhaps what comes over most powerfully is the paradox of the subtitle: it is often not one or the other but both satisfaction in resentment and *vice versa*. Shaw anatomized this vividly in *The Doctors' Dilemma*.

A welcome book, this, to review and to commend. Beware: your reading list will become longer. Mine now runs through retirement and the grave to Elysium. My favourite medical book was given to me by the Arundel general practitioner who welcomed me as an undergraduate into his family, home, life and practice nearly 40 years ago; *A Fortunate Man*, about a general practitioner's relationship with patients, influences my practice still. The doctor John Berger portrayed as Sassall could perhaps not bear too much reality and ended his own life. Another Powell (J E) observed that all political careers end in failure: so do medical ones—don't they?

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The Knowing Animal: a Philosophical Inquiry into Knowledge and Truth

Raymond Tallis
330 pp Price £19.99 ISBN 1-7486-1953-4 (p/b)
Edinburgh: Edinburgh University Press

What is it to be human? Raymond Tallis's *The Knowing Animal*, the third instalment of his 'Handkind' trilogy, seeks an answer by setting up a counterpoint between what he sees as two distinct categories—animals that are merely sentient, and 'knowing' animals (us). What follows is an account of knowledge as a form of awareness unique to human beings, an attempt to 'liberate mankind from a religious self interpretation without passing straight into a stunted scientistic account', a new description of what we are and how we have come about.

For Tallis, the wellspring of knowledge, the dividing line between the world of sentient animals and knowing animals, is the existential intuition, confined to human beings, 'that I am [this]'. The origins of this intuition, bound to the capabilities of the opposable thumb (hence, handkind), are discussed in the first two books of the trilogy, but at its core lies the development of an awareness of the self as a thing (self-consciousness) with an ability to act upon and change the world around it (agency). With this awareness comes a sense of perspective, as we go beyond direct experience (for this is the sentience that all animals share) and become aware that 'I' am having an experience from a certain viewpoint (my own). From this awareness comes knowledge—the understanding 'that X is the case', a description of a fixed relationship between a knowing animal, or conscious subject, and an object or idea. As objects of knowledge suggest possibilities that lie

beyond direct experience, abstract knowledge is born—for example, that 'if I do Y, X will be the case'. Using these terms Tallis builds a picture of what it is to know and the way in which, as he puts it, 'the creature that experiences its body as being both itself and not itself, and so discovers its toes in a way that no other animal discovers part of the organism it is, extends its enquiries in to infinite space and eventually discovers Alpha Centauri'. He then goes on to explore some of the implications of what it is to know in this way to be thus separated from the world of direct experience.

The Knowing Animal is driven by a sense of wonder at humanity. Whilst full-time philosophers are often interested in being clever, right, or important, Tallis (essentially a physician) is motivated by the defence of his subject—people. When I took this book to the philosophy group at my local pub they immediately began to mutter about logical inconsistencies and disrespectful treatment of their personal favourites; also, some of them even moaned about the cover. They reckoned that Tallis the 'amateur' would fare poorly under rigorous philosophical questioning by the group, after the standard dose of two pints of Tetley's; and it is true that certain arguments that might undermine his central thesis are left unexplored. But my friends were missing the point: on the subject of humanity Tallis is far from being an amateur. For he has spent a professional lifetime in medicine; and the insight or intuitive understanding that this has brought about enables him to reject the alternative explications of humanity offered, for example, by darwinists or marxists or the great religions. The critics do have some cause for complaint: *The Knowing Animal* is subtitled an 'inquiry into knowledge and truth' but it sometimes feels closer to a proof of something of which the author was already certain. Nonetheless, this work ought to become part of the humanist canon; with his swingeing attacks on both scientism and superstition, Tallis has proved himself a doughty spokesman for handkind.

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The Anti-Vaccination Movement in England, 1853–1907

Nadja Durbach
276 pp Price US$22.95 ISBN 0-8233-3423-2 (p/b)
Durham NC/London: Duke University Press

Advocates of immunization from the world of public health often illustrate their talks and articles with anti-vaccination cartoons from the nineteenth century. Their theme is that these campaigns and their associated prejudices are always with us, but merely fluctuate in intensity over the years. In the conclusion of her account of the anti-vaccination movement in England, the historian Nadja Durbach endorses the view that 'concerns of parents today echo those of their Victorian ancestors'. Whereas supporters of child immunization programmes regard the views of anti-vaccinationists, past and present, as irrational and potentially damaging to public health, Durbach starts from a benign stance towards contemporary anti-vaccination campaigns—an outlook that leads to a more sympathetic interpretation of the nineteenth century movement than it has previously received. Her final chapter aims to complete the circle by providing historical legitimacy for today's campaigners against MMR and other immunizations.

While Durbach's highly subjective approach may yield some insights into the activities of the campaign and its leading personalities, it risks divorcing the movement's local and particular features from its wider historical context. Thus Durbach begins by dismissing nineteenth century smallpox statistics as 'problematic' and, conceding that 'how well nineteenth century vaccination actually worked is a complicated historical question', makes no further attempt to answer it. No doubt it is true that statistics of efficacy and safety were manipulated by both sides in the controversy. Nevertheless, to discuss the anti-vaccination controversy without providing some basic facts about the epidemiology of smallpox is a radical concession to post-modernist subjectivism.

According to Thomas McKeown, the professor of social medicine now popular among anti-vaccinationists because of his scepticism in the 1970s regarding the contribution of medical interventions towards improving life expectancy in Britain, 'most epidemiologists are agreed that we owe the decline of mortality from smallpox mainly to vaccination'. The technique of inoculation or variolation was widely used around Europe after Queen Caroline submitted her children to this procedure in response to the 'great smallpox scare' of 1721. Following Edward Jenner's promotion of vaccination from the late 1790s—using lymph derived from cowpox instead of smallpox—this practice spread rapidly, in Britain and on the Continent.

By the 1850s, when compulsory vaccination was first introduced in England, smallpox was already in retreat, though it still killed more than 5000 people every year and left many more disfigured with pock-marks. After the Europe-wide epidemic of 1871–2, when the death rate in England rose to more than 10 000, smallpox went into rapid decline: by the 1890s, when the anti-vaccine campaign reached its peak, annual mortality was down to a few hundred. Though Durbach (accurately) describes vaccination as 'an invasive, insanitary and sometimes disfiguring procedure', which in some cases caused blood-borne diseases, infections and gangrene, she says nothing of its benefits (and makes no attempt to quantify the true

extent of the adverse reactions). Again, while she focuses on resistance to vaccination, she ignores the public demand for it, particularly in response to epidemics which provoked intense popular fears.

A number of distinctive features of the anti-vaccination movement emerge from Durbach's fascinating account. She reveals the movement's cross-class character: though some of its leading figures were derived from the upper classes, its activists were largely drawn from the lower middle and respectable working classes (women as well as men). The anti-vaccinationists' rejection of government and medical coercion in relation to health reflected a wider suspicion of state intervention in personal and family affairs. Activists were often also religious dissenters, trade unionists and radicals; they were opponents of vivisection, and supporters of temperance, vegetarianism and alternative medicine. As well as being an effective parliamentary lobby, anti-vaccinationism was a militant mass movement, given to carnivalesque demonstrations and riotous protests.

Here the differences between the nineteenth century movement and contemporary anti-vaccination campaigns are more striking than the superficial parallels noted by Durbach. Though today's anti-vaccinationist campaigns get some support from quirky aristocrats, their base of support is almost exclusively middle class. Activists object to particular vaccines (in Britain mainly MMR, in the USA mainly those containing mercury). They have no objection to state intervention in any other area and, though some favour homeopathy or other alternative therapies, many seek to justify their concerns about vaccine safety with reference to mainstream medical science. Indeed some of the most prominent campaigns are careful to point out that they are not 'anti-vaccine' but simply concerned to promote 'informed choice' by parents. However disingenuous this posture may be, it reflects the general defensiveness of current campaigns and the limited scope of their resistance to medical authority. In contrast with the collective campaigns of the past, today's have a strongly individualistic character. Rather than demanding the abandonment of the national immunization programme, they merely request the choice of mercury-free vaccines, or single agents rather than MMR. Campaigns—in reality little more than websites run by a few individuals—provide information (often misleading) and contact details for solicitors pursuing compensation claims for alleged vaccine injuries.

In retrospect, it may be that the anti-vaccination movement deserves the condescension of posterity more than the plaudits of post-modernity offered by Durbach. At least in its resistance to the denial of individual freedom in the compulsory vaccination policy, the nineteenth century movement reflected a libertarian impulse. Today's reactionary and misguided campaigns lack even this redeeming feature.

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